

WHAT IS CLAIMED IS:

1. A system for piercing dermal tissue, the system comprising
a skin-piercing element;
at least one electrical contact; and
a meter configured for measuring an electrical characteristic existent between
the skin piercing element and the at least one electrical contact when the system is in
use.
2. The system of claim 1, wherein the at least one electrical contact is an
electrical skin contact.
3. The system of claim 1, wherein the meter is configured to measure an
electrical characteristic between the skin-piercing element and the at least one
electrical contact that is indicative of dermal tissue penetration by the skin-piercing
element.
4. The system of claim 1, wherein the meter is configured to measure an
electrical characteristic between the skin-piercing element and the at least one
electrical contact that is indicative of a stability of dermal tissue penetration by the
skin-piercing element.
5. The system of claim 1, wherein the meter is configured to measure an
electrical characteristic between the skin-piercing element and the at least one
electrical contact that is indicative of dermal tissue penetration residence time by the
skin-piercing element.
6. The system of claim 1, wherein the electrical characteristic is the
electrical resistance between the skin-piercing element and the at least one electrical
contact.

7. The system of claim 1, wherein the electrical characteristic is the electrical impedance between the skin-piercing element and the at least one electrical contact.

8. The system of claim 1, wherein the at least one electrical contact includes a first electrical contact and a second electrical contact.

9. The system of claim 8, wherein the meter is further configured for measuring an electrical characteristic existent between the first and second electrical contacts.

10. The system of claim 1, wherein the meter includes a pressure/contact ring and the at least one electrical contact is integrated with the pressure/contact ring.

11. The system of claim 1, wherein the skin-piercing element is a micro-needle.

12. The system of claim 11, wherein the micro-needle is a component of an integrated micro-needle and biosensor medical device.

13. A system for piercing dermal tissue, the system comprising
a skin-piercing element;
a first electrical contact;
a second electrical contact; and
a meter configured for measuring an electrical characteristic existent between the skin piercing element and the first and second electrical contacts when the system is in use.

14. The system of claim 13, wherein the electrical characteristic is the electrical impedance between the skin-piercing element and both of the first and second electrical contacts.

15. The system of claim 13, wherein the meter includes a pressure/contact ring and the first and second electrical contacts are integrated with the pressure/contact ring.

16. The system of claim 13, wherein the skin-piercing element is a micro-needle.

17. The system of claim 16, wherein the micro-needle is a component of an integrated micro-needle and biosensor medical device.

18. The system of claim 13, wherein the first electrical contact is a first electrical skin contact and the second electrical contacts is a second electrical skin contact.

19. A method for piercing dermal tissue comprising:
contacting dermal tissue with at least one electrical contact; and
inserting a skin-piercing element into the dermal tissue while
measuring an electrical characteristic existent between the skin-piercing element and
the at least one electrical contact, thereby penetrating the dermal tissue.

20. The method of claim 19 further including the step of presenting a user with an indicator of a dermal tissue penetration depth of the skin-piercing element, said indicator being based on the measured electrical characteristic.

21. The method of claim 19 further including the step of presenting a user with an indicator of a dermal tissue penetration stability of the skin-piercing element, said indicator being based on the measured electrical characteristic.

22. The method of claim 19 further including the step of presenting a user with an indicator of dermal tissue penetration residence time of the skin-piercing element, said indicator being based on the measured electrical characteristic.

23. The method of claim 19, wherein the inserting step includes inserting a micro-needle skin-piercing element.

24. The method of claim 19, wherein the inserting step includes inserting a micro-needle of an integrated micron-needle and biosensor medical device.

25. The method of claim 19, wherein the inserting step further involves measuring the electrical characteristic prior to contact between the skin-piercing element and the dermal tissue, when the skin-piercing element has contacted the dermal tissue and when the skin-piercing element has penetrated the dermal tissue.

26. The method of claim 19, wherein the measuring is accomplished by applying a current in the range of 1mA to 10 mA.

27. The method of claim 19, wherein the measuring is accomplished using a potential frequency in the range of 10 KHz to 1 MHz, where the low end of the frequency prevents user discomfort and the high end of the frequency minimizes stray capacitance from being measured.